Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Periodic Table Activity: Why is the Periodic Table Set up the way it is?**

**Phase 0:** Why do you think the periodic table is arranged the way it is? In other words, do you recognize any patterns on the periodic table?

**Phase 1:** You will each be given an element. Once you have gotten your element, please answer the following 3 questions:

1. Which element were you given? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Write out the electron configuration of your element:
3. Locate your element on the periodic table, and then write the symbol of your element in its appropriate place on your blank periodic table.

**Phase 2:** Form a group with the other elements whose electron configurations end in the same type of sublevel as your element. For example, the electron configuration of Carbon is 1s2
2s22p2. The last sublevel type that is filled in in Carbon is the p sublevel, so Carbon should get together with all of the other elements that have their final electrons in a p sublevel. **Sit down with your group and answer the first 3 questions.**

1. What is the final sublevel type in your electron configuration? Circle one:

s p d f

1. Fill in the symbols of the other elements that are in your group in their respective places on your blank periodic table.

1. Approximately where on the periodic table are all of the elements in your sublevel located? Use the location of the other elements on your periodic table to make a generalization about this. (i.e. are you all in the center of the periodic table? To the right? To the left? Spread out all over the place?)

**Phase 3:** Within your sublevel group, get together with the elements that have the same **number** of electrons in their final sublevel. For example, Carbon has 2 electrons in the last sublevel that is filled, so Carbon would get together with all of the other elements that also have 2 electrons in their final sublevel. **Sit down with your new groups and answer questions 1-3.**

1. How many electrons are in your final sublevel? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which other elements also have the same number of electrons in their final sublevel as you?
3. Where on the periodic table are the elements in your new electron group located relative to you? (i.e. are they in the same row as you? Same column? Diagonal from you?)

**Phase 4:** Form a group with the elements that have their last electrons in the same sublevel. For example, the last sublevel that is filled in Carbon is the 2p sublevel, so C should get together with all of the other elements that have their final electrons in the 2p sublevel. **Sit down with your new groups and answer questions 1-3.**

1. What is the final energy level does the last sublevel in your electron configuration have? Please circle one:

1s 2s 2p 3s 3p 3d 4s 4p 4d 4f 5s 5p 5d 5f 6s 6p 6d 6f 7s 7p 7d 7f

1. Where on the periodic table is your element located relative to the other elements in your group? (i.e. are they in the same row as you? Same column? Diagonal from you?)

On a scale from one to 10, how much did you like this activity? (1 being awful, and 10 being pretty cool) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Did it help you to conceptualize how the periodic table is set up? Why or why not?

**Conclusions:**

Answer the following questions in complete sentences on a SEPARATE SHEET OF PAPER. You may need to use your textbook (pages 119-122) for reference:

1. How are the different sublevels (s, p, d, f) arranged on the periodic table? You may want to draw a figure to represent your findings.
2. How many columns are in each block? \*\*remember there are 4 blocks!\*\*

How does this relate to what we know about the number of electrons that can fit in the four different sublevels?

1. How many periods are there? What does each period represent? In which way do the periods increase? (Do they increase from top to bottom, or from bottom to top?)
2. Using your answer to the previous question, how is the periodic table arranged with regards to energy?
3. So why is the periodic table set up the way it is? Synthesize all of the conclusions we reached above Include the following words in your answer: energy, electrons, sublevel, period, group